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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,911	11/26/2001	Kozo Akiyoshi	13823	7552

293	7590	02/02/2006		

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EXAMINER
CHEN, WENPENG

ART UNIT	PAPER NUMBER
2625	

DATE MAILED: 02/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>30 November 2005</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-21</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-21</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application

is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR

1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn

pursuant to 37 CFR 1.114. Applicant's submission filed on 11/30/2005 has been entered.

Examiner's responses to Applicant's remark

2.   Applicants' arguments with regard to art rejection based on Jung '030 are

persuasive. A new ground of rejections is provided below.

3.   Applicants' arguments with regard to art rejection based on Jung '761 are not

persuasive. The Examiner has thoroughly reviewed Applicants' arguments but firmly believes

that the cited reference to reasonably and properly meet the claimed limitation.

Applicants' argument -- In the Jung references (Jung '030 and Jung '761), difference data

is only calculated between the predicted current frame and the current frame. Since this set of

frames is different from the set of reference frame and current frame they cannot also correspond

to the first frame and the second frame in claim 1 of the current application.

Examiner's response -- The Examiner disagreed with this conclusion. Although the

applicants mentioned both Jung '030 and Jung '761, no details of arguments are referred to Jung

'761.

Claim Rejections - 35 USC § 112

4.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

5.   Claims 1-3, 15, 18, and 21 are rejected under 35 U.S.C. 112, second paragraph, as

being indefinite for the following reasons.

There are insufficient antecedent bases for the following limitations.

-- Claim 1 recites the limitation "the corresponding points" in line 6.

-- Claim 15 recites the limitation "the corresponding points" in line 7.

-- Claim 21 recites the limitation "said corresponding points" in line 5.

Claim Rejections - 35 USC § 102

6.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on
> sale in this country, more than one year prior to the date of application for patent in the United States.

7.   Claims 1-6, 18-19, and 21 are rejected under 35 U.S.C. 102(b) as being

anticipated by Jung et al. (US patent 5,978,030, hereafter referred as Jung 030', cited previously.)

Jung 030' teaches an image interpolation method, comprising:

-- acquiring a first image and a second image; (column 10, lines 50-64; *The*

reconstructed reference frame and the current frame are the 1st and 2nd images, respectively.)

-- computing a matching between the first image and the second image by detecting

points which correspond between the images; (column 12, line 4 to column 14, line 13; column

14, lines 14-27; *The matching is computed between the reconstructed reference frame and the*

current frame based on motion compensation between corresponding points between the

reconstructed reference frame and the current frame. The corresponding points are detected

through motion vector determination based on the original reference frame and the current

frame. Please note that the claim recitation does not require detecting the corresponding points

by comparing any specific pair of images, Furthermore, the passage in column 12, lines 4-12

teaches mapping corresponding feature points between the reconstructed reference frame and

the current frame.)

-- generating a corresponding point file based on the matching, where the corresponding

point file comprises positional information on the corresponding points and difference data on

attribute values of the corresponding points; (column 7, lines 29-44; column 7, line 65 to column

8, line 9; column 14, lines 14-27; The position addresses and motion vectors of features points

are the positional information. The error signal comprises difference data on attribute values of

the corresponding points of features points and every pixel.)

-- wherein the difference data on attribute values comprises a difference between an attribute value of a point in the first image and an attribute value of a corresponding point in the second image; (column 7, lines 29-44; column 7, line 65 to column 8, line 9; The difference between a reconstructed pixel value of the original image and a pixel value of a corresponding point in the current image.)

-- wherein said attribute values of the corresponding points comprise color values of the corresponding points; (column 6, lines 19-36; Digital video signal is either color or black-and while. In the first case, there are RGB components of various intensities. In the second case, there are gray-level intensities. The intensities are the color values.)

-- generating an intermediate image based on the first image and the second image by performing interpolation based on the first image and the corresponding point file; (column 14, lines 14-27; *The predicted current frame signal is the intermediate image, predicted based on the reconstructed reference frame and the motion vectors that are based on the current frame.*)

-- wherein the difference data are entropy-coded and, thereafter, the entropy-coded difference data are stored in the corresponding point file. (entropy coder 107 of Fig. 1; The entropy-coded difference data reside in the corresponding point file.)

Jung 030' teaches an image interpolation apparatus (Fig. 1), comprising:

-- an image input unit which acquires a first image and a second image; (column 10, lines 50-64; *The reconstructed reference frame and the current frame are the 1st and 2nd images, respectively.*)

-- a matching processor which computes a matching between the first image and the second image and which generates a corresponding point file by detecting points that correspond

between the images, (column 12, line 4 to column 14, line 13; column 14, lines 14-27; *The*

matching is computed between the reconstructed reference frame and the current frame based on

motion compensation between corresponding points between the reconstructed reference frame

and the current frame. The corresponding points are detected through motion vector

determination based on the original reference frame and the current frame. Please notethat the

claim recitation does not require detecting the corresponding points by comparing any specific

pair of images, Furthermore, the passage in column 12, lines 4-12 teaches mapping

corresponding feature points between the reconstructed reference frame and the current frame.)

    -- wherein the corresponding point file comprises positional information on the points

that correspond between the images and difference data of pixel values on the points that

correspond between the images; (column 7, lines 29-44; column 7, line 65 to column 8, line 9;

column 14, lines 14-27; The position addresses and motion vectors of features points are the

positional information. The error signal comprises difference data on attribute values of the

corresponding points of features points and every pixel.)

    -- wherein said matching processor detects points on the second image that correspond to

lattice points of a mesh provided on the first image, and based on a thus detected result a

destination polygon corresponding to the second image is defined on a source polygon that

constitutes the mesh on the first image; (column 10, lines 50-65; column 12, line 4 to column 14,

line 13; The lattice points of a mesh for matching are provided from the original reference frame

through the reconstructed reference frame.)

-- wherein the difference data are entropy-coded and, thereafter, the entropy-coded

difference data are stored in the corresponding point file. (entropy coder 107 of Fig. 1; The

entropy-coded difference data reside in the corresponding point file.)

Jung 030' teaches an image interpolation method, comprising:

-- acquiring a first image and a second image; (column 10, lines 50-64; *The*

reconstructed reference frame and the current frame are the 1st and 2nd images, respectively.)

-- computing a matching between the first image and the second image by detecting

points which correspond between the images, said matching further comprising computing

positional information for said corresponding points and difference data on attribute values for

the corresponding points; (column 12, line 4 to column 14, line 13; column 14, lines 14-27; *The*

matching is computed between the reconstructed reference frame and the current frame based on

motion compensation between corresponding points between the reconstructed reference frame

and the current frame. The corresponding points are detected through motion vector

determination based on the original reference frame and the current frame. Please note that the

claim recitation does not require detecting the corresponding points by comparing any specific

pair of images, Furthermore, the passage in column 12, lines 4-12 teaches mapping

corresponding feature points between the reconstructed reference frame and the current frame;

column 7, lines 29-44; column 7, line 65 to column 8, line 9; column 14, lines 14-27; The

position addresses and motion vectors of features points are the positional information. The error

signal comprises difference data on attribute values of the corresponding points of features points

and every pixel.)

-- generating a corresponding point file based on the matching, where the corresponding

point file comprises said positional information and said difference data. (column 7, lines 29-44;

column 7, line 65 to column 8, line 9; column 14, lines 14-27; The position addresses and motion

vectors of features points are the positional information. The error signal comprises difference

data on attribute values of the corresponding points of features points and every pixel.)

8.   Claims 1-5, 7, 9, 11, 13-14, and 18-21 are rejected under 35 U.S.C. 102(b) as

being anticipated by Jung et al. (US patent 5,654,761, hereafter referred as Jung 761', cited

previously.)

a.   Jung 761' teaches an image interpolation method, comprising:

-- acquiring a first image and a second image; (column 4, lines 23-65; The previous

frame and the current frame are the 1st and 2nd images, respectively.)

-- computing a matching between the first image and the second image by detecting

points which correspond between the images; (column 3, line 40 to column 4, line 65. The

current frame and previous frame are matched with the feature points to determine motion

vectors of the feature points. In the process, points which correspond between the images are

determined.)

-- computing a matching between the first image and the second image by detecting

points which correspond between the images, said matching further comprising computing

positional information for said corresponding points and difference data on attribute values for

the corresponding points; (column 3, line 40 to column 4, line 65. The current frame and

previous frame are matched with the feature points to determine motion vectors of the feature

points. In the process, points which correspond between the images are determined. The position

addresses and motion vectors of features points are the positional information. The error signal

comprises difference data on attribute values of the corresponding points of features points and

every pixel)

  -- generating a corresponding point file based on the matching, where the corresponding

point file comprises positional information on the corresponding points and difference data on

attribute values of the corresponding points; (column 3, line 40 to column 4, line 22 ; The

position addresses and motion vectors of features points are the positional information. The error

signal comprises difference data on attribute values of the corresponding points of features points

and every pixel.)

  -- wherein the difference data on attribute values comprises a difference between an

attribute value of a point in the first image and an attribute value of a corresponding point in the

second image; (column 3, line 40 to column 4, line 22; the difference between appoint in the

predicted current image and a pixel value of a corresponding point in the current image.)

  -- wherein said attribute values of the corresponding points comprises color values of the

corresponding points; (column 3, line 40 to column 4, line 22; Video signal is either color or

black-and while. In the first case, there are RGB components of various intensities. In the second

case, there are gray-level intensities. The intensities are the color values.)

  -- generating an intermediate image based on the first image and the second image by

performing interpolation based on the first image and the corresponding point file; (column 3,

line 40 to column 4, line 22; The predicted current frame is the intermediate image that is based

on the previous frame.)

-- wherein the difference data are entropy-coded and, thereafter, the entropy-coded

difference data are stored in the corresponding point file. (coder 107 of Fig. 1; The entropy-

coded difference data reside in the corresponding point file.)

Jung 761' teaches an image interpolation apparatus (Fig. 1), comprising:

-- an image input unit which acquires a first image and a second image; (column 4, lines

23-65; The previous frame and the current frame are the 1st and 2nd images, respectively.)

-- a matching processor which computes a matching between the first image and the

second image and which generates a corresponding point file by detecting points that correspond

between the images; (column 3, line 40 to column 4, line 65. The current frame and previous

frame are matched with the feature points to determine motion vectors of the feature points. In

the process, points which correspond between the images are determined.)

-- wherein the corresponding point file comprises positional information on the points

that correspond between the images and difference data of pixel values on the points that

correspond between the images; (column 3, line 40 to column 4, line 22 ; The position addresses

and motion vectors of features points are the positional information. The error signal comprises

difference data on attribute values of the corresponding points of features points and every

pixel.)

-- wherein the difference data are entropy-coded and, thereafter, the entropy-coded

difference data are stored in the corresponding point file. (; The entropy-coded difference data

reside in the corresponding point file.)

b.   Jung 761' teaches an image interpolation apparatus, comprising:

-- a communication unit which acquires a corresponding point file which describes a

matching result of a first image and a second image wherein the corresponding point file

comprises positional information on points which correspond between the first image and the

second image and difference data of attribute values of points which correspond between the first

image and the second image; (column 5, lines 28-37; The encoded error signal and motion

vectors generated in Fig. 1 are transmitted to the decoder shown in Fig. 4.)

-- an intermediate image generator which generates an intermediate image based on the

first image and the second image by performing interpolation based on the first image and the

corresponding point file; (column 5, lines 28-64; The predicted current frame signal is the

intermediate image.)

-- further comprising a corresponding point file storage unit for storing the corresponding

point file in a manner such that the corresponding point file is associated with the first image;

(memory 424 of Fig. 4)

-- wherein said intermediate image generator generates said intermediate image by

moving a point within the first image according to the positional information and varying the

attribute value of the point based on the difference data. (column 5, line 28 to column 6, line 7;

The adder 415 of Fig. 4 provides the varying function.)

The above citations also teach the method of Claim 14.

c.   With regard to the newly added Claim 20, there is no frame between the previous

frame and the current frame that are the 1st and 2nd images, respectively. Thus, the intermediate

image cannot relate to any known frame between the previous frame and the current frame. The

above-cited passages therefore teach then feature recited in Claim 20.

-- wherein said intermediate image does not relate to a known frame between said first

image and said second image.

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10.   Claims 8, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Jung et al. (US patent 5,654,761) as applied to Claim 7, and further in view of Burns (US

patent 5,940,129 cited previously.)

Jung 761' teaches every limitations of Claims 8, 10, and 12 except the feature related to a

display unit.

Burns teaches decoding a video sequence and display the video, comprising:

-- a display unit which displays the video image. (Fig. 4)column 6, line 61 to column 7,

line 14)

It is desirable to receive and view a video, because that provides final utility. It would

have been obvious to one of ordinary skill in the art, at the time of the invention, to apply Burns'

teaching to use a display unit to display the decoded images, including the frames stored in

memory 424, of Jung 761' because the combination provides final utility. The combination thus teaches an apparatus further comprising:

-- a display unit which displays at least the intermediate image.

10.   Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jung et al. (US patent 5,654,761) in view of Pearlman et al. (US patent 5,764,807 cited previously.)

Claims 15-17 recite the corresponding media storing computer programs for implementing the methods of Claims 1, 4, and 14, respectively.

Jung 761', as discussed above, teaches the methods of claims 1, 4, and 14. However, Jung 761' does not explicitly teach a computer readable medium as recited in the claims.

Pearlman teaches a computer program product comprising a computer readable medium and a computer program. (Column 2, lines 47-53)

It is desirable to make a processing method portable from a computer to another computer. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to store the processing steps of the method taught by Jung 761' in a computer readable medium taught by Pearlman, because the combination makes the processing method portable and therefore increase its application.

Conclusion

11.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 571-272-7431. The examiner can normally be reached on 8:30 am - 5:00 pm.
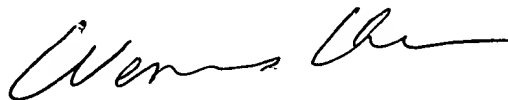
If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone numbers for the

organization where this application or proceeding is assigned are 571-273-8300 for regular

communications and 571-273-8300 for After Final communications. TC 2600's customer service

number is 571-272-2600.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is 571-272-2600.

Wenpeng Chen
Primary Examiner
Art Unit 2624

January 31, 2006